

Customer No.: 31561
Docket No.: 10790-US-PA
Application No.: 10/709,588

REMARKS

Present Status of the Application

Claim 1-9 are rejected. Specifically, claims 1-3 and 7-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Wu et al. (U. S. Patent 6,187,613; hereinafter Wu). Claims 1, 3, and 5-9 rejected under 35 U.S.C. 102(e) as being anticipated by Brandenburger (U. S. Patent 6,976,600). Claims 1, 3-7 and 9 are rejected under 35 U.S.C. 102(e) as being anticipated by Ma et al. (U. S. Patent 6,617,682; hereinafter Ma). Applicants have amended independent claim 1. After entry of amendments, claims 1-9 remain pending in the present application, and reconsideration of those claims is respectfully requested.

Discussion of Claim Rejections under 35 USC 102

Claims 1-3 and 7-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Wu. Claims 1, 3, and 5-9 rejected under 35 U.S.C. 102(e) as being anticipated by Brandenburger. Claims 1, 3-7 and 9 are rejected under 35 U.S.C. 102(e) as being anticipated by Ma. Applicants have amended independent claim 1, and respectfully traverse the rejections for at least the reasons set forth below.

1. With respect to independent claim 1, the present invention, as for example shown in FIG. 5, the heat sink 130 has a size significantly larger than a size of the chip 102. Then, when the underfill 160a material is applied, the space between the heat sink and the substrate is not completely filled by the underfill material 160a. In other

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words, the under fill material 160a is just filled into the space between the active surface of the chip and the substrate, and then holds the heat sink.

In re Wu (see FIG. 2), the whole space 22 is filled with the encapsulant.

In re Brandenburger (see Fig. 4), the underfill material 208 fills the whole space between the HIS 501 and the substrate 210.

In re Ma (see FIG. 7), the whole free space between the substrate 310 and the heat spreader 320 is filled with the encapsulation material 340. In order to easily fill the space, the vent through hole 324 is used together (col. 6, liens 2-6).

Therefore, the present invention is distinguishable over the prior art references.

2. With respect to dependent claim 5, the stopper 134, as for example shown in FIG. 8, is further recited. It should be noted that the stopper 340 is on an outer edge of the through hole 132. This is helpful to locally fill the underfill material via the through hole.

In re Brandenburger (see Fig. 4), the through hole 504 is at the lower side. There is no stopper at all. It should be noted that the item 502 is a sealant material to secure the HIS 501 (col. 5, lines 5-7).

In re Ma (see Fig. 7), the item 212 and 214 are the pillars surrounding the die 220 (col. 4, liens 45-49), so as to form a closing space. The through hole 322 extends through the heat spreader 320. Apparently, the underfill material is not locally filling the space. There is no stopper disclosed at all in Ma.

For at least the foregoing reasons, claim 5 further distinguishes over the prior art

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references.

With at least the foregoing reasons, Applicants respectfully submit that independent claim 1 patently defines over the prior art references, and should be allowed. For at least the same reasons, dependent claims 2-9 patently define over the prior art references as well.

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CONCLUSION

For at least the foregoing reasons, it is believed that all the pending claims 1-9 of the invention patently define over the prior art and are in proper condition for allowance. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

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Respectfully submitted,

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